

650V N-CHANNEL ENHANCEMENT MODE MOSFET

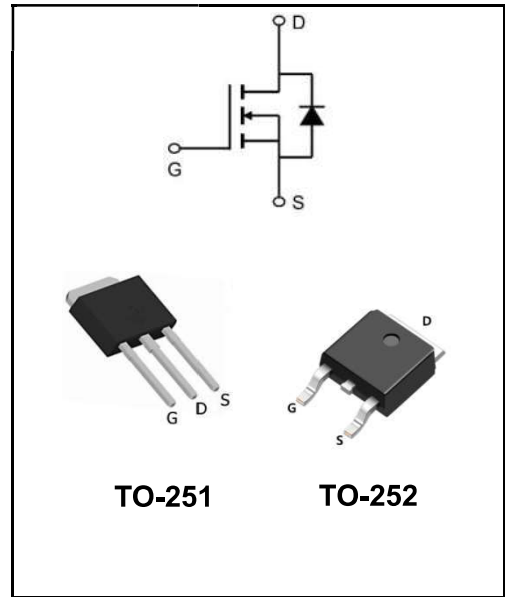
MAIN CHARACTERISTICS

I_D	2A
V_{DSS}	650V
R_{DS(on)-typ(@V_{GS}=10V)}	< 4.8Ω (Type:4Ω)



Application

- ◆Uninterruptible Power Supply(UPS)
- ◆Power Factor Correction (PFC)



Product Specification Classification

Part Number	Package	Marking	Pack
YFW2N65AD	TO-252	YFW 2N65AD XXXXX	2500PCS/Tape
YFW2N65AMJ	TO-251	YFW 2N65AMJ XXXXX	4000PCS/Tape

Maximum Ratings at T_c=25°C unless otherwise specified

Characteristics	Symbols	Value	Units
Drain-Source Voltage (V _{GS} = 0V)	V _{DS}	650	V
Continuous Drain Current	I _D	2	A
Pulsed Drain Current	I _{DM}	6	A
Gate - Source Voltage	V _{GS}	±30	V
Single Pulse Avalanche Energy	E _{AS}	57	mJ
Avalanche Current	I _{AR}	2.4	A
Repetitive Avalanche Energy	E _{AR}	6.4	mJ
Power Dissipation (T _A =25°C)	P _D	25	W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C
Thermal Resistance, Junction-to-case	R _{θJC}	5	°C/W
Thermal Resistance, Junction ambient	R _{θJA}	60	°C/W

Maximum Ratings at Tc=25°C unless otherwise specified

Characteristics	Test Condition	Symbols	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	V(BR)DSS	650	-	-	V
Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ C$	I_{DSS}	-	-	1	μA
Gate-Source Leakage	$V_{GS}=\pm 30V$	I_{GSS}	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	V_{GS(th)}	3.0	-	4	V
Drain-Source On-Resistance (Note3)	$V_{GS}=10V, I_D=1.0A$	R_{DS(ON)}	-	4	4.8	Ω
Input Capacitance	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	C_{iss}	-	310	-	pF
Output Capacitance		C_{oss}	-	39	-	
Reverse Transfer Capacitance		C_{rss}	-	6	-	
Total Gate Charge	$V_{DD}=520V$ $I_D=2A$ $V_{GS}=10V$	Q_g	-	8.0	-	nC
Gate-Source Charge		Q_{gs}	-	1.2	-	
Gate-Drain Charge		Q_{gd}	-	5	-	
Turn-on delay time	$V_{DD}=300V$ $I_D=2A$ $R_G=25\Omega$	t_{d(on)}	-	7.8	-	ns
Turn-on Rise Time		T_r	-	33	-	
Turn-Off Delay Time		t_{d(OFF)}	-	23	-	
Turn-on Fall Time		t_f	-	59	-	
Continuous Body Diode Current	$T_C=25^\circ C$	I_S	-	-	2	A
Pulsed Diode Forward Current		I_{SM}	-	-	8	
Body Diode Voltage	$T_J=25^\circ C, I_{SD}=2A, V_{GS}=0V$	V_{SD}	-	-	1.4	V
Reverse Recovery Time	$V_{GS}=0V, I_S=2A$ $diF/dt=100A/\mu s$	t_{rr}	-	80	-	nS
Reverse Recovery Charge		Q_{rr}	-	1.8	-	uC

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS}=2.4A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$

Ratings and Characteristic Curves

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

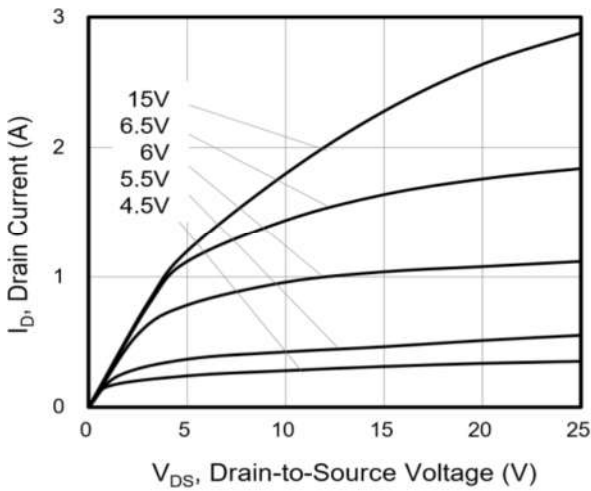


Figure 2. Body Diode Forward Voltage

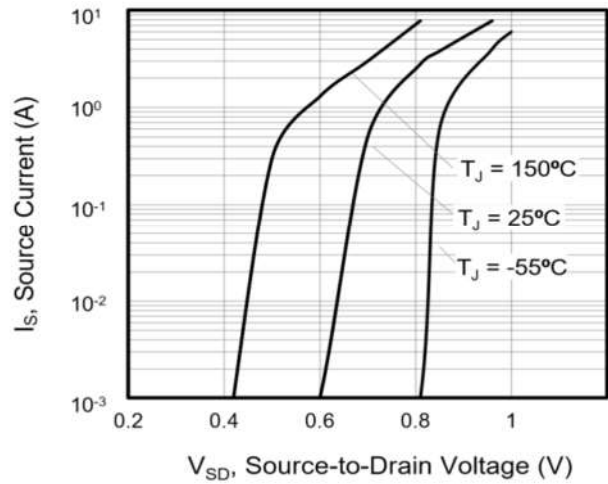


Figure 3. Drain Current vs. Temperature

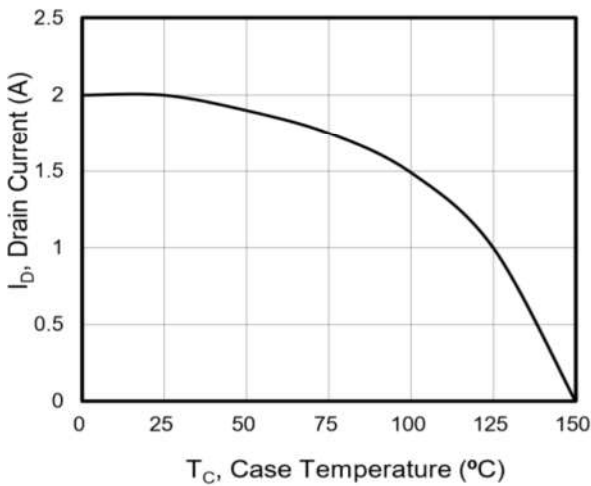


Figure 4. Power Dissipation vs. Temperature TO-251, TO-252

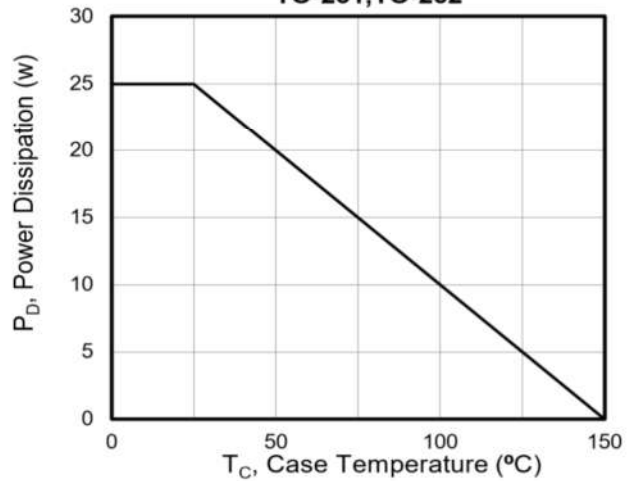


Figure 5. Transfer Characteristics

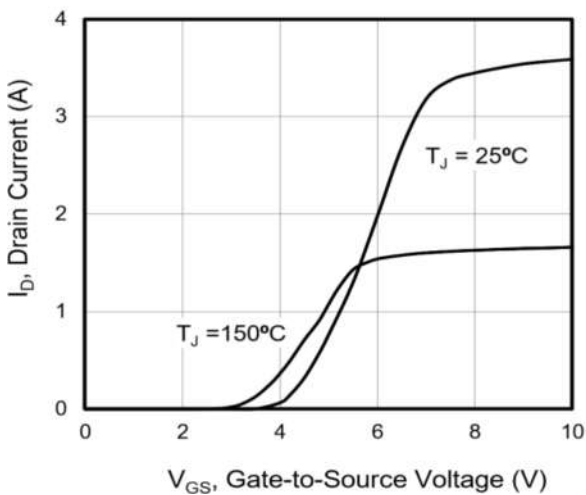
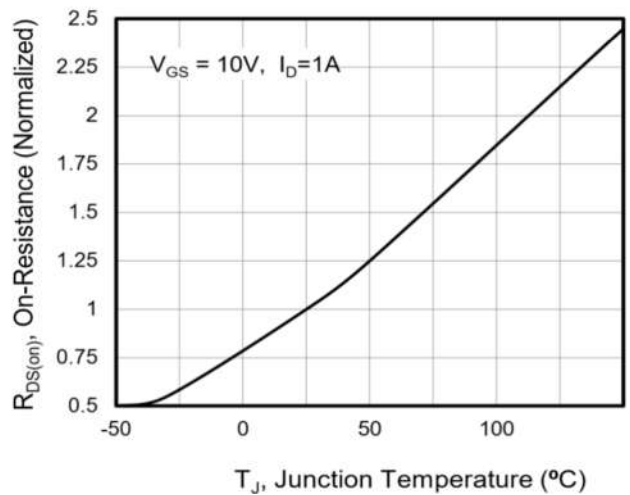
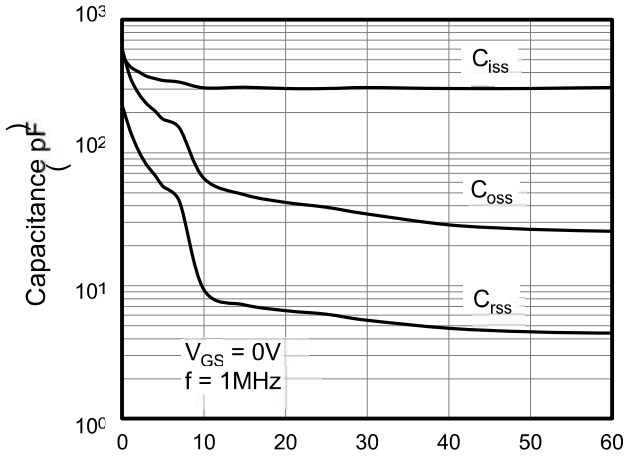


Figure 6. On-Resistance vs. Temperature



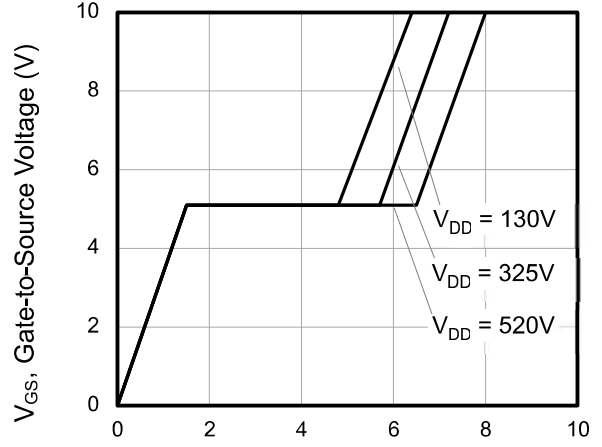
Ratings and Characteristic Curves

Figure 7. Capacitance



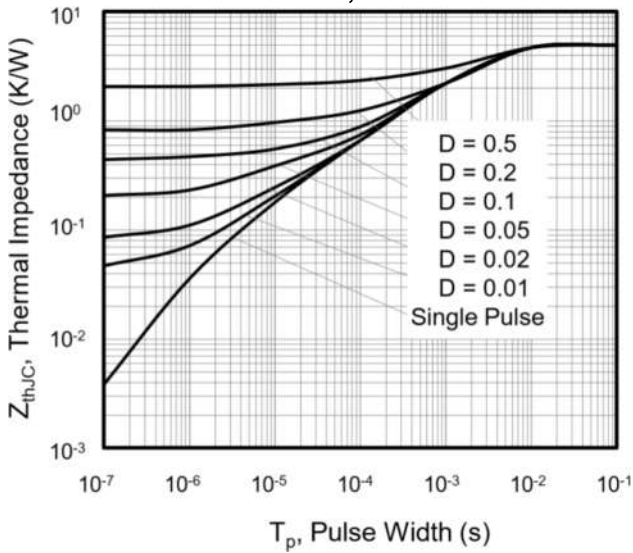
V_{DS} , Drain-to-Source Voltage (V)

Figure 8. Gate Charge



Q_g , Total Gate Charge (nC)

Figure 9. Transient Thermal Impedance
TO-251, TO-252



Ratings and Characteristic Curves

Figure A: Gate Charge Test Circuit and Waveform

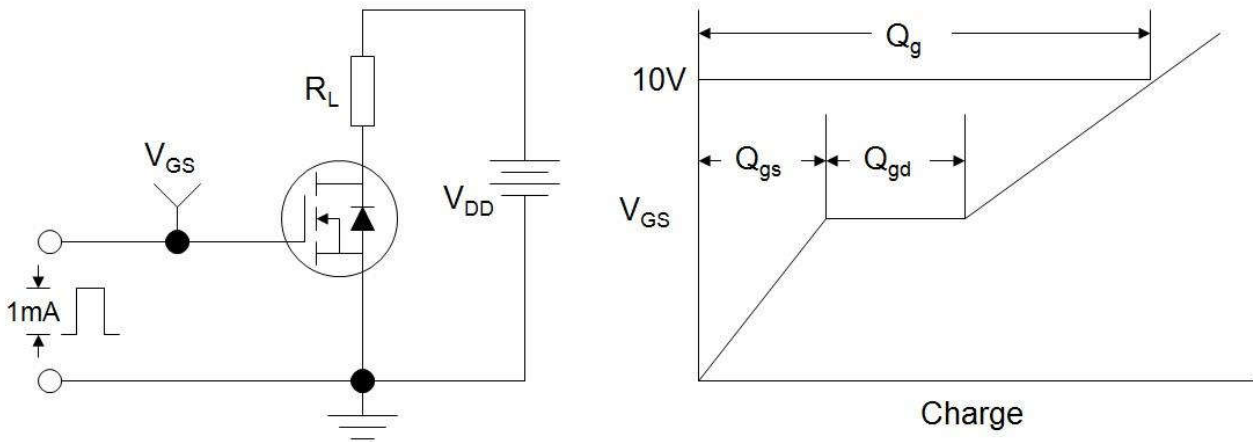


Figure B: Resistive Switching Test Circuit and Waveform

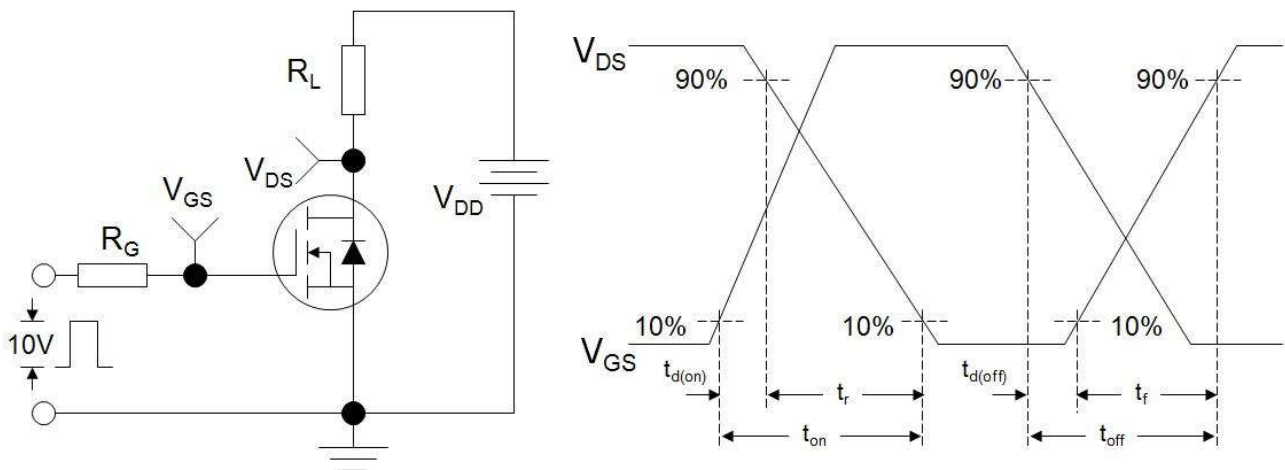
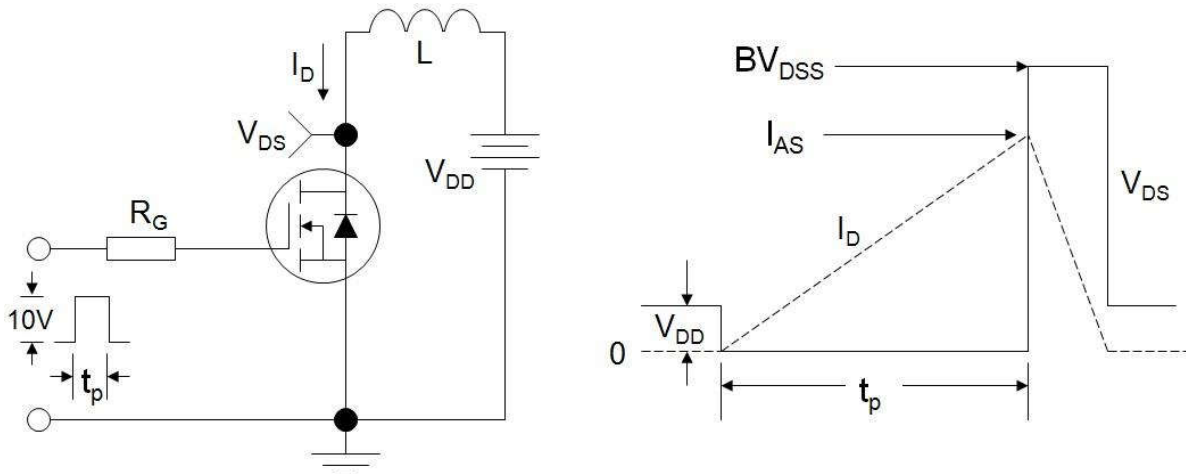
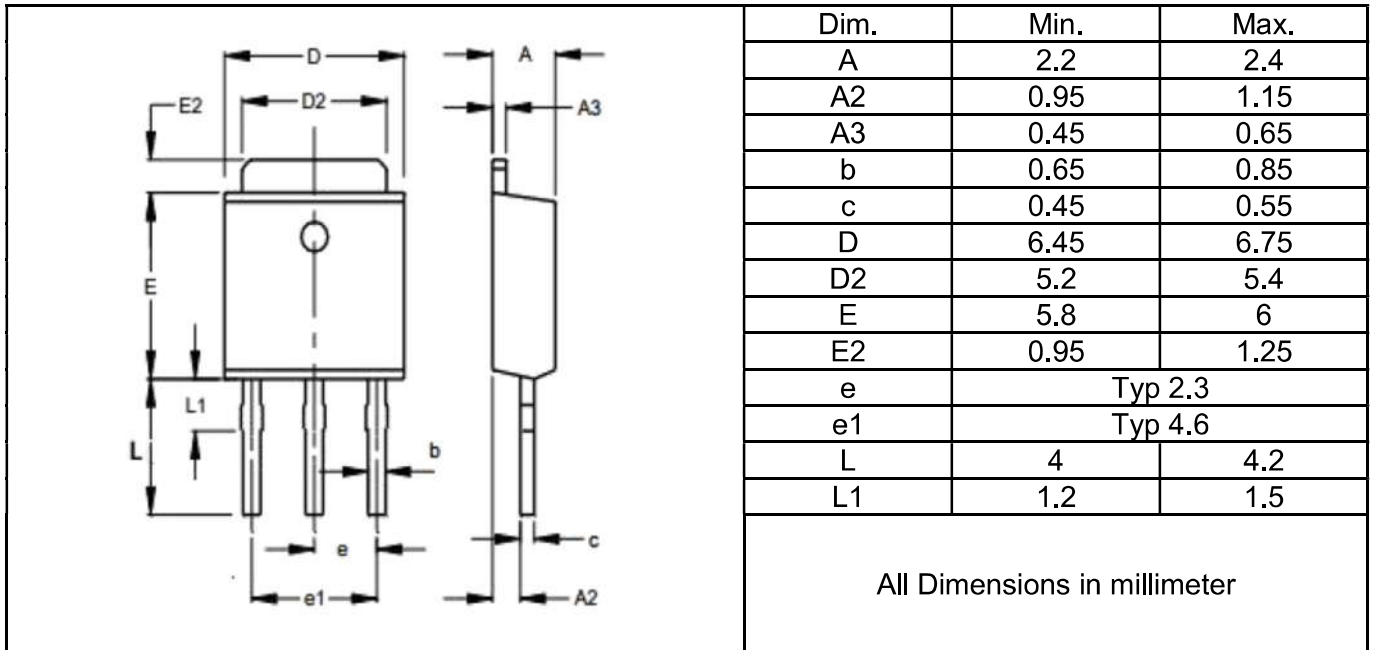


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

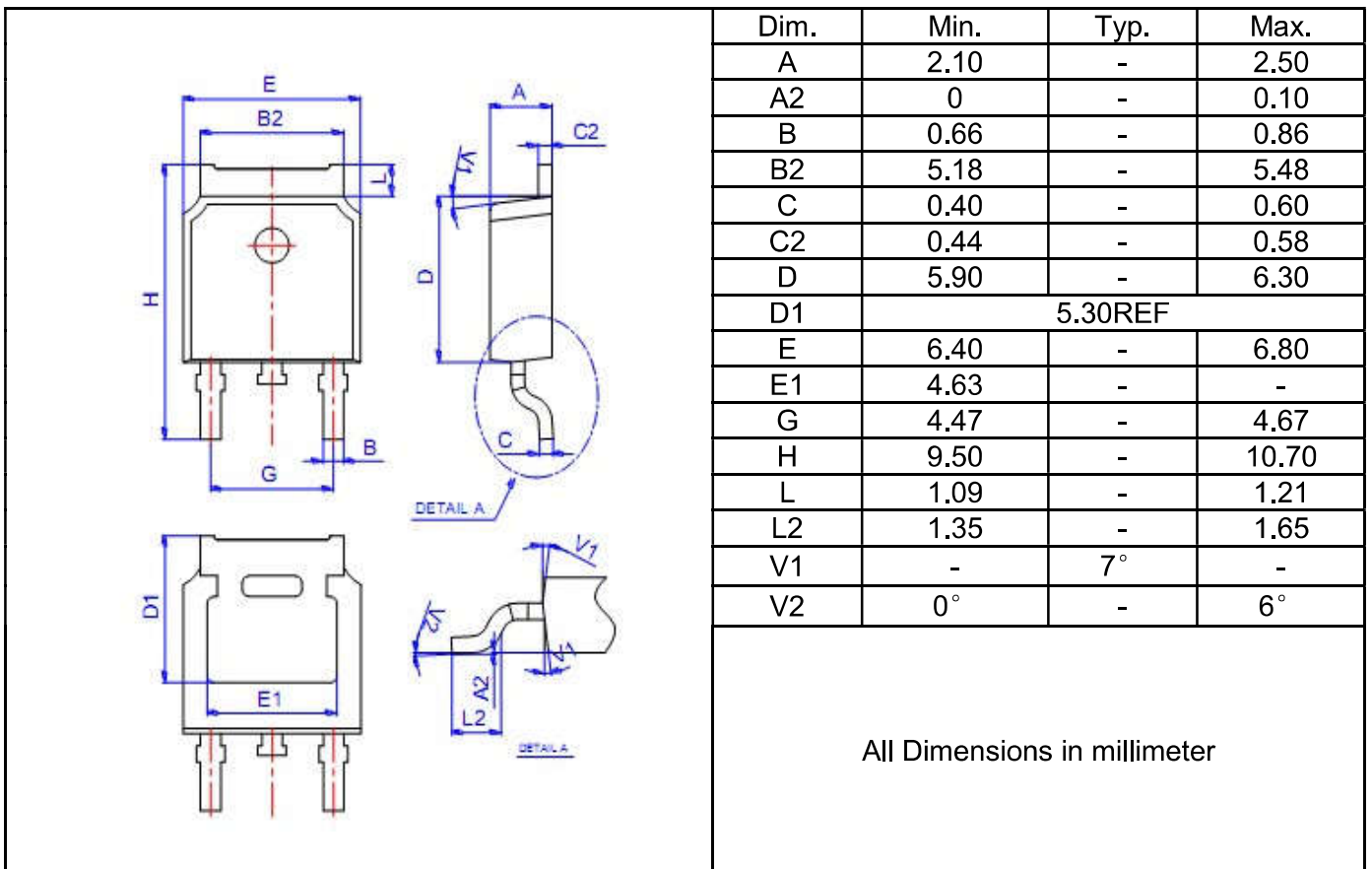


Package Outline Dimensions Millimeters

TO-251



TO-252



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